

CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Cancelled)
2. (Currently Amended) ~~A composite nano-particle composed of three parts comprising a~~ An electron-excited nano-crystal phosphor as defined in claim 29, wherein the peripheral surface of said core part of [[a]] said nano-crystal, [[a]] said surface-modifying part for coating the surface of said core part to modify the surface, and [[an]] said insulating shell part the peripheral surface of which is charged by the same charge made up of a substance forming a glass state so as to coat the surface of said surface-modifying part.
3. (Cancelled)
4. (Currently Amended) ~~A composite nano-particle described in claim 3~~ An electron-excited nano-crystal phosphor as defined in claim 29, wherein the surface-modifying agent having the surface-modifying part having [[a]] the covalent bond part forming [[a]] the covalent bond with [[a]] the bond defect of said composite nano-particle nano-particles is an organometallic compound having SH group, -NH₃ group at its terminal and that said the insulating shell part comprises a transparent material.
5. (Currently Amended) ~~A composite nano-particle described in claim 4~~ An electron-excited nano-crystal phosphor as defined in claim 4, wherein the transparent material made up of the substance forming the glass state constituting said insulating shell part comprises as a main component a compound selected from the group consisting of SiO, SiO₂, SiN, SiON, Si₃N₄, Al₂O₃, and TiO₂.
6. (Currently Amended) ~~A composite nano-particle described in claim 3~~ An electron-excited nano-crystal phosphor as defined in claim 29, wherein said dispersion-stabilizing agent is sodium citrate and said surface-modifying agent is illustrated by the general formula;
$$(R_1O)(R_2O)(R_3O)Si-R_4-SH$$

wherein each of R₁, R₂, R₃ and R₄ is an alkyl group.
7. (Cancelled)
8. (Currently Amended) ~~A composite nano-particle described in claim 1~~ An electron-excited nano-

crystal phosphor as defined in claim 29, wherein the surface-modifying ~~layer part~~ of the composite ~~nano-particle~~ nano-particles is carbonized.

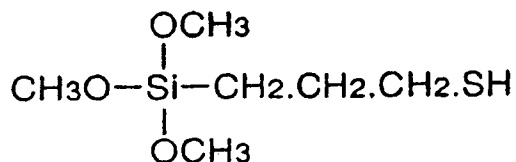
9. - 11. (Cancelled)

12. (Currently Amended) A method of preparing ~~a composite nano-particle described in claim 9~~ an electron-excited nano-crystal phosphor as defined in claim 30, wherein said dispersion-stabilizing agent is a metallic salt having at least two carboxyl groups ~~or above~~.

13. (Currently Amended) A method of preparing ~~a composite nano-particle described in claim 9~~ an electron-excited nano-crystal phosphor as defined in claim 30, wherein said surface-modifying agent is an organometallic compound having -SH group, -NH₂ group at its terminal.

14. (Currently Amended) A method of preparing ~~a composite nano-particle described in claim 9~~ an electron-excited nano-crystal phosphor as defined in claim 13, wherein said organometallic compound is 3-mercaptopropyl trimethoxysilane (MPS) illustrated by the chemical formula 1.

(chemical formula 1)



15. (Currently Amended) A method of preparing ~~a composite nano-particle described in claim 9~~ an electron-excited nano-crystal phosphor as defined in claim 30, wherein in the step of forming the nano-sized insulating shell layer on the surface of the core layer of the composite nano-particle, said insulating shell layer is formed of sodium silicate.

16. - 28. (Cancelled)

29. (New) An electron-excited nano-crystal phosphor made up of at least three parts of nano-sized composite nano-particles comprising:

a core part of nano-crystal phosphor particle doped with an activator, said phosphor particle being selected from the group consisting of ZnS:Mn, ZnS:Cl, ZnS:Cu, Al, CaS:Eu, CaS:Ce, CaS:Mn, CaS:Cu, CaS:Sb, CaS:Eu, Ce, CaS:Sm, CaS:Pb, CaS:Gd, CaS:Tb, CaS:Dy, CaS:Ho, CaS:Er, CaS:Tm, CaS:Yb, MgS:Eu, MgS:Ce, MgS:Mn, SrS:Eu, SrS:Ce, SrS:Mn, BaS:Eu, BaS:Ce and BaS:Mn;

a surface-modifying part coating the surface of said core part and having a bonding part for bonding the periphery of said core part to a bond defect of said nano-crystal phosphor particle; and

an insulating shell part coating the surface of said surface-modifying part, said insulating shell part being formed of, as a substrate, a substance forming a glass state on the surface of said surface-modifying agent.

30. (New) A method of preparing an electron-excited nano-crystal phosphor comprising the steps of:
forming a core part of an electron-excited composite nano-crystal phosphor and a surface-modifying part for coating the surface of said core part concurrently by a coprecipitation method in the presence of both a dispersion-stabilizing agent and a surface-modifying agent; and

forming a nano-sized insulating part on the surface of said surface-modifying part;

wherein said nano-crystal phosphor is selected from the group consisting of ZnS:Mn, ZnS:Cl, ZnS:Cu, Al, CaS:Eu, CaS:Ce, CaS:Mn, CaS:Cu, CaS:Sb, CaS:Eu, Ce, CaS:Sm, CaS:Pb, CaS:Gd, CaS:Tb, CaS:Dy, CaS:Ho, CaS:Er, CaS:Tm, CaS:Yb, MgS:Eu, MgS:Ce, MgS:Mn, SrS:Eu, SrS:Ce, SrS:Mn, BaS:Eu, BaS:Ce and BaS:Mn, and is prepared by a sequential step of adding the sulfide phosphor matrix as an anion material and Group II metal as a cation material so as to coprecipitate the anion material and the cation material of the phosphor in that order.

31. (New) A method of preparing an electron-excited nano-crystal phosphor as defined in claim 30, wherein said dispersion-stabilizing agent is sodium citrate.